

REMARKS

Claims 1-32 are pending in the present patent application. Claims 1-32 stand rejected.  
This application continues to include claims 1-32.

Applicants hereby incorporate their arguments as against the rejection of claims 1-32 as set forth in their previous Response, mailed February 27, 2006.

Claims 1, 5-7, 11-17, and 30-32 were rejected under 35 U.S.C. §102(b) as being anticipated by Kao, et al., U.S. Patent Application Publication No. 2002/0018086 A1 (hereinafter, Kao). Applicants respectfully request reconsideration of the rejection of claims 1, 5-7, 11-17, and 30-32 in view of the following.

Kao is directed to a driving circuit of an ink jet print head (page 1, paragraph 2). Kao discloses a first heating pulse 435, which is a preheating pulse that preheats all ink jet cells regardless of whether they will eject ink or not. The first heating pulse 435 is less than the threshold at which ink is ejected. The ink jet cells that are intended to eject ink receive a second heating pulse 438, and the total received energy exceeds the threshold, so that the nozzles eject ink (page 4, paragraph 34, Fig. 10).

Applicants believe that claims 1, 5-7, 11-17, and 30-32 patentably define Applicants' invention over Kao, for at least the reasons set forth below.

Claim 1 is directed to a method for providing a plurality of fire pulses in an ink jet printer. Claim 1 recites, in part, producing a plurality of fire signals, each fire signal of said plurality of fire signals being asserted at a different timing than other of said plurality of fire signals.

As set forth in their previous response, Kao does not disclose, teach, or suggest the above-recited subject matter of claim 1, since Kao discloses a single fire signal.

For example, in contrast to producing a plurality of fire signals, each fire signal of the plurality of fire signals being asserted at a different timing than other of the plurality of fire signals, Kao discloses a single fire signal, which is second heating pulse 438, which is used to eject ink (page 4, paragraph 34). In addition, it is clear from Kao Fig. 10 that the first Kao heating pulse 435 is asserted at the same timing for all ink jet cells, and hence, is not part of a fire signal that is asserted at a different timing than other of a plurality of fire signals, as recited in claim 1.

However, in the Response to Arguments, the Examiner asserts that “the claim language does not define wherein the fire signal causes ink ejection. Instead, the fire signal interpreted in light of the specification is for energizing the actuators.”

Applicants’ respectfully disagree with the Examiner’s interpretation of the term, “fire signal,” as recited Applicants’ claims, for at least the reasons set forth below.

The Patent and Trademark Office (“PTO”) determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction “in light of the specification as it would be interpreted by one of ordinary skill in the art.” *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 [70 USPQ2d 1827] (Fed. Cir. 2004). (Emphasis added).

Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the

context of the entire patent, including the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir., 2005).

Applicants' respectfully submit that Applicants' claim term, "fire signal," upon giving that term is broadest reasonable construction in light of light of the specification as it would be interpreted by one of ordinary skill in the art, clearly relates to a signal that causes an actuator to eject ink.

For example, Applicants' respectfully direct the Examiner's attention to Applicants' specification at page 7, lines 19-25, which is reproduced below for the sake of convenience.

Fire signals 106, 108, 110, 112, 114, 116 can include a prefire pulse PRE1, for example, and a mainfire pulse MAIN1, each having a width according to the desired energy to be delivered to an associated actuator. The prefire pulse is typically used to warm the printhead and the mainfire pulse fires ink from the nozzles. Both prefire pulse widths and mainfire pulse widths can be varied as a function of printhead temperature to maintain a constant drop mass and size of the expelled ink thereby ensuring consistent image quality. (Emphasis added).

Thus, as used in the context of Applicants' specification, the fire signal "fires" ink from the nozzle, which hence, clearly employs the word, "fire" in "fire signal" in the sense of "firing" a gun, as the term, "fire" is commonly used.

Accordingly, Applicants' respectfully submit that the term, "fire signal," upon giving that term is broadest reasonable construction in light of light of the specification as it would be interpreted by one of ordinary skill in the art, clearly relates to a signal that causes an actuator to eject ink.

In addition, Applicants' also respectfully direct the Examiner's attention to Applicants' specification at page 12, lines 8-13, which is reproduced below for the sake of convenience.

In step S106, actuators are energized using the decoded fire signals. Actuators 88 are energized, for example, using decoded fire signals F1\_C0, F2\_C0, F1\_C1, F2\_C1, F1\_C2 and F2\_C2.

In step S108, an image or image segment is printed. The energized actuators 88 in step S106 causes nozzles 86 to expel ink resulting in the printing of an image or image segment. (Emphasis added).

Thus, as used in the context of Applicants' specification, the fire signal energizes the actuators to cause the nozzles to expel ink.

Accordingly, even if Applicants' chosen term, "fire signal," were interpreted to mean "energizing the actuators," it is clear that upon giving the broadest reasonable construction in light of light of the specification as it would be interpreted by one of ordinary skill in the art, "fire signal" clearly relates to a signal that energizes an actuator to expel ink.

The Examiner also asserts, in the Response to Arguments, that the first and second Kao heating pulses 435 and 438 are "asserted at a different timing respect to the other in a period of time."

Although Kao Fig. 10 may arguably disclose heating pulses 435 and 438 being asserted at a different timing with respect to each other, the fact that the first heating pulse 435 is applied to all Kao ink jet cells, whether or not they are intended to eject ink, whereas second heating pulse 438 is applied only to ink jet cells intended to eject ink, precludes the combination of Kao heating pulses 435 and 438 from being a fire signal within the context of Applicants' claimed invention, since the first Kao heating pulse 435 is clearly unrelated to ejecting ink, because it is applied to all ink jet cells, whether or not they are intended to eject ink.

Even if the Kao heating pulses were combined to arguably produce a fire signal within the context of Applicants' invention, e.g., a fire signal including a prefire pulse PRE1, for example, and a mainfire pulse MAIN1, as set forth in the excerpt from Applicants' specification at page 7, lines 19-25, it is clear that such a combination would yield only a single fire signal, as that term is used in Applicants' specification and claims, and would not disclose, teach, or suggest a plurality of fire signals, each fire signal of the plurality of fire signals being asserted at a different timing than other of the plurality of fire signals.

Claim 1 also recites, in part, and combining said plurality of fire signals to form a composite fire signal that maintains said different timing.

Since, as set forth above, Kao does not disclose, teach, or suggest a fire signal within the context of Applicants' invention, it is clear that Kao does not disclose, teach, or suggest combining a plurality of fire signals to form a composite fire signal that maintains a different timing, as recited in claim 1.

Accordingly, for at least the reasons set forth above, Applicants respectfully submit that Kao does not disclose, teach, or suggest the subject matter of claim 1.

Claims 5 and 6 are believed allowable due to their dependence on otherwise allowable base claim 1, and further and patentably define Applicants' invention for substantially the same reasons as set forth in Applicants' Response, mailed February 27, 2006.

Claim 7 is directed to an ink jet printer. Claim 7 recites, in part, a controller communicatively coupled to said printhead carrier for producing a plurality of fire signals, each fire signal of said plurality of fire signals being asserted at a different timing than other

of said plurality of fire signals, said controller combining said plurality of fire signals to form a composite fire signal that maintains said different timing.

Claim 7 is believed allowable in its present form for substantially the same reasons as set forth above with respect to claim 1.

Claims 11-17 are believed allowable due to their dependence, directly or indirectly, on otherwise allowable base claim 7, and further and patentably define Applicants' invention for substantially the same reasons as set forth in Applicants' Response, mailed February 27, 2006.

In addition, claim 12 is directed to the ink jet printer of claim 11, wherein said plurality of composite fire signals is associated with a plurality of ink colors.

As set forth above with respect to claim 11, Kao does not disclose, teach, or suggest a plurality of composite fire signals.

In addition, Kao simply does not disclose, teach, or suggest any correlation of a fire signal with a plurality of ink colors. Rather, the Kao disclosure does not even include the word, "color."

Although the Examiner asserts in the Response to Arguments that Kao is a "certainly" a black-white or color printer, and that Kao's plurality of heating signals is for a particular color ink (either B, M, C, or Y), it is clear that the entire Kao disclosure does not even mention the word, "color," and likewise does not "M, C, or Y" inks.

Further, Kao clearly does not even remotely disclose, teach, or suggest anything akin to a plurality of colors, as recited in claim 12, much less wherein the plurality of composite fire signals is associated with a plurality of ink colors.

To anticipate a claim, the reference must teach every element of the claim. MPEP 2131. (Emphasis added). “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (MPEP 2131).

Since Kao does not teach every element of claim 12, i.e., a plurality of colors, as recited in claim 12, and wherein the plurality of composite fire signals is associated with a plurality of ink colors, and since each and every element as set forth in claim 12 is not found, either expressly or inherently described in Kao, it is clear that under MPEP 2131, claim 12 is not anticipated by Kao.

Accordingly, claim 12 is believed allowable in its own right.

Claim 30 is directed to a method for providing a plurality of fire pulses in an ink jet printer, comprising the step of producing a plurality of fire signals specific to a particular color, each fire signal of said plurality of fire signals being asserted at a different timing than other of said plurality of fire signals.

For substantially the same reasons as set forth above with respect to claim 1, Kao does not disclose, teach, or suggest producing a plurality of fire signals specific to a particular color, each fire signal of said plurality of fire signals being asserted at a different timing than other of said plurality of fire signals.

Accordingly, claim 30 is believed allowable in its present form.

Claims 31 and 32 are believed allowable due to their dependence, directly or indirectly, on otherwise allowable base claim 30, and further and patentably define

Applicants' invention for substantially the same reasons as set forth in Applicants' Response, mailed February 27, 2006.

Accordingly, for at least the reasons set forth above, Applicants believe that claims 1, 5-7, 11-17, and 30-32 are in condition for allowance in their present form, and thus respectfully request that the rejection of claims 1, 5-7, 11-17, and 30-32 under 35 U.S.C. 102(b) be withdrawn.

Claim 30 was rejected under 35 U.S.C. §102(b) as being anticipated by Umezawa, et al., U.S. Patent No. 6,276,776 B1 (hereinafter, Umezawa). Applicants respectfully request reconsideration of the rejection of claim 30 in view of the following.

Umezawa is directed to controlling the temperature of a plurality of recording heads in order to maintain recording temperature in a low-temperature environment (col. 1, lines 11-14). Umezawa discloses an ink jet printer 200 having four (4) recording heads 9A-9D (col. 5, lines 16-30, Figs. 1 and 2). 9A1 to 9D1 denote sub-heaters for heating the respective recording heads 9A to 9D, and 10A to 10D are temperature sensors for detecting temperatures of the respective recording heads 9A to 9D (col. 5, lines 53-56, Fig. 1).

The temperature of each of the recording heads 9A to 9D is controlled using four (4) pulse-width modulated (PWM) periods, one for each recording head, based on the temperature detected by temperature sensors 10A to 10D, and the pulses are repeatedly provided until the recording heads reach the desired temperature (col. 6, lines 33-57, Fig. 3). The recording operation is then started after reaching the optimum recording temperature (col. 7, lines 9-12).

Thus, Umezawa discloses using pulse-width modulated signals as to heat each recording head to a desired temperature.



Applicants believe that claim 30 patentably defines Applicants' invention over Umezawa, for at least the reasons set forth below.

Claim 30 is directed to method for providing a plurality of fire pulses in an ink jet printer, comprising the step of producing a plurality of fire signals specific to a particular color, each fire signal of said plurality of fire signals being asserted at a different timing than other of said plurality of fire signals.

Umezawa does not disclose, teach, or suggest producing a plurality of fire signals specific to a particular color, much less wherein each fire signal of said plurality of fire signals being asserted at a different timing than other of said plurality of fire signals, as recited in claim 30.

In contrast to claim 30, Umezawa is directed to controlling the temperature of a plurality of recording heads in order to maintain recording temperature in a low-temperature environment (col. 1, lines 11-14). Umezawa controls the recording head temperature by controlling sub-heaters 9A1-9D1 in response to temperature sensors 10A1-10D1 to heat the recording heads 9A-9D, respectively, to a temperature, and then printing is performed (col. 5, lines 16-30, Figs. 1 and 2; col. 5, lines 53-56, Fig. 1; col. 6, lines 33-57, Fig. 3; and col. 7, lines 9-12).

Thus, the pulses disclosed by Umezawa are not fire signals within the context of Applicants' invention.

However, in the Response to Arguments, the Examiner asserts that "the claim language does not define wherein the fire signal causes ink ejection. Instead, the fire signal interpreted in light of the specification is for energizing the actuators."

Applicants' respectfully disagree with the Examiner's interpretation of the term, "fire signal," as recited Applicants' claims, for at least the reasons set forth below.

The Patent and Trademark Office ("PTO") determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction "in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 [70 USPQ2d 1827] (Fed. Cir. 2004). (Emphasis added).

Applicants' respectfully submit that Applicants' claim term, "fire signal," upon giving that term is broadest reasonable construction in light of light of the specification as it would be interpreted by one of ordinary skill in the art, clearly relates to a signal that causes an actuator to eject ink.

For example, Applicants' respectfully direct the Examiner's attention to Applicants' specification at page 7, lines 19-25, which is reproduced below for the sake of convenience.

Fire signals 106, 108, 110, 112, 114, 116 can include a prefire pulse PRE1, for example, and a mainfire pulse MAIN1, each having a width according to the desired energy to be delivered to an associated actuator. The prefire pulse is typically used to warm the printhead and the mainfire pulse fires ink from the nozzles. Both prefire pulse widths and mainfire pulse widths can be varied as a function of printhead temperature to maintain a constant drop mass and size of the expelled ink thereby ensuring consistent image quality. (Emphasis added).

Thus, as used in the context of Applicants' specification, the fire signal "fires" ink from the nozzle, which hence, clearly employs the word, "fire" in "fire signal" in the sense of "firing" a gun, as the term, "fire" is commonly used.

Accordingly, Applicants' respectfully submit that the term, "fire signal," upon giving that term is broadest reasonable construction in light of light of the specification as it would

be interpreted by one of ordinary skill in the art, clearly relates to a signal that causes an actuator to eject ink.

In addition, Applicants' also respectfully direct the Examiner's attention to Applicants' specification at page 12, lines 8-13, which is reproduced below for the sake of convenience.

In step S106, actuators are energized using the decoded fire signals. Actuators 88 are energized, for example, using decoded fire signals F1\_C0, F2\_C0, F1\_C1, F2\_C1, F1\_C2 and F2\_C2.

In step S108, an image or image segment is printed. The energized actuators 88 in step S106 causes nozzles 86 to expel ink resulting in the printing of an image or image segment. (Emphasis added).

Thus, as used in the context of Applicants' specification, the fire signal energizes the actuators to cause the nozzles to expel ink.

Accordingly, even if Applicants' chosen term, "fire signal" were interpreted to mean "energizing the actuators," it is clear that upon giving the broadest reasonable construction in light of light of the specification as it would be interpreted by one of ordinary skill in the art, "fire signal" clearly relates to a signal that energizes an actuator to expel ink.

Rather than being fire signals, the Umezawa pulses clearly are what is known in the art as warming pulses used to maintain the temperature of the Umezawa recording heads, without ejecting ink, since Umezawa clearly discloses that the pulses are repeatedly provided until the recording heads reach the desired temperature (col. 6, lines 33-57, Fig. 3), and the recording operation is then started after reaching the optimum recording temperature (col. 6, lines 9-12).

In addition, there is not plurality of Umezawa signals that are specific to a particular color. Rather, Umezawa discloses a single signal for each recording head (Fig. 3).

Accordingly, Umezawa does not disclose, teach, or suggest producing a plurality of fire signals specific to a particular color, each fire signal of the plurality of fire signals being asserted at a different timing than other of the plurality of fire signals, as recited in claim 30.

Accordingly, for at least the reasons set forth above, Applicants believe that claim 30 is in condition for allowance in their present form, and thus respectfully request that the rejection of claim 30 under 35 U.S.C. 102(b) be withdrawn.

Claims 18, 19, 24, and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Inui, et al., U.S. Patent No. 6,344,867 B2 (hereinafter, Inui) in view of Sueoka, et al., U.S. Patent No. 6,024,439 (hereinafter, Sueoka). Applicants respectfully request reconsideration of the rejection of claims 18, 19, 24, and 25 in view of the following.

Applicants have submitted arguments in their Response, mailed February 27, 2006, which clearly show that claims 18, 19, 24, and 25 are patentable over Inui in view of Sueoka.

Under MPEP 707.07(f), where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it.

However, the Examiner has not answered the substance of Applicants' arguments. Accordingly, Applicants' respectfully request the Examiner to withdraw the rejection of claims 18, 19, 24, and 25, or to provide Applicants' with an answer to their arguments.

For the sake of convenience to the Examiner, Applicants' set forth their arguments pertaining to claims 18, 19, 24, and 25 below.

Inui is directed to thermal printing and a thermal printing method (col. 1, lines 8-10). Inui discloses a thermal printer having a thermal head 15 for printing on thermosensitive

recording material 10 (col. 4, lines 28-33). Thermal head 15 includes a heating element array 21 having heating elements R1-R1024 (col. 4, lines 64-66). Heating element array 21 is kept pressed on recording material 10 during recording (col. 5, lines 1-3).

In order to perform printing, controller 26 generates a heating pulse, and sends the pulse to AND gates corresponding to heating elements R1-R1024 by way of an enabling signal, which powers the heating elements to generate heat (col. 8, lines 28-45).

Inui also discloses a combined heating information generator circuit that sends a head driver 70 three-value gradation heating data (col. 11, lines 23-28). Head driver 70 includes a decoder 57 that receives the three-value gradation data, and supplies decoded data to a shift register (col. 11, lines 34-48, Fig. 7).

Sueoka is directed to an ink jet head (col. 1, lines 7-8). Sueoka discloses as background ejecting ink using thermal energy acting on a liquid for abruptly heating the liquid to generate a bubble, which ejects the ink (col. 1, lines 15-30).

Applicants believe that claims 18, 19, 24, and 25 patentably define Applicants' invention over Inui in view of Sueoka, for at least the reasons set forth below.

Claim 18 is directed to a printhead cartridge for an ink jet printer. Claim 18 recites, in part, a decoder circuit in communication with said actuator firing logic circuit, said decoder circuit including at least one input for receiving at least one composite fire signal.

In contrast to claim 18, Inui discloses a combined heating information generator circuit that sends a head driver 70 three-value gradation heating data (col. 11, lines 23-28). Head driver 70 includes a decoder that receives the three-value gradation data (referred to as

combined heating data in Fig. 7), and supplies decoded data to a shift register (col. 11, lines 34-48, Fig. 7).

The Inui three-value gradation data is known in the art as print data, and clearly does not disclose, teach, or suggest a fire signal within the context of Applicants' invention.

Rather, in order to perform printing, controller 26 generates a heating pulse, and sends the pulse to AND gates corresponding to heating elements R1-R1024 by way of an enabling signal, which powers the heating elements to generate heat (col. 8, lines 28-45).

Thus, it is the Inui enabling signal that sends the heating pulse, which corresponds generally to a fire signal, and not the Inui three-value gradation data.

The Patent and Trademark Office ("PTO") determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction "in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 [70 USPQ2d 1827] (Fed. Cir. 2004). (Emphasis added).

Upon giving claim 18 its broadest reasonable construction "in light of the specification as it would be interpreted by one of ordinary skill in the art," it is clear that the Inui three-value gradation data, i.e., print data, does not disclose, teach, or suggest a fire signal within the context of Applicants' claims.

In addition, the Inui enabling signal is not supplied to the Inui decoder 57, and the Inui decoder 57 does not include at least one input for receiving the Inui enabling signal, and hence, .

Further, Inui simply does not disclose, teach, or suggest that the Inui enabling signal is a composite fire signal within the context of Applicants' claimed invention.

Accordingly, Inui does not disclose, teach, or suggest a decoder circuit in communication with the actuator firing logic circuit, the decoder circuit including at least one input for receiving at least one composite fire signal, as recited in claim 18.

Sueoka also does not disclose, teach, or suggest a decoder circuit in communication with said actuator firing logic circuit, said decoder circuit including at least one input for receiving at least one composite fire signal, nor does the Examiner assert as much. Rather, the Examiner relies on Sueoka for an asserted teaching of a thermal printer having an ink jet printhead.

Accordingly, for at least the reasons set forth above, Applicants respectfully submit that Inui and Sueoka, taken alone or in combination, do not disclose, teach, or suggest the subject matter of claim 18. Thus, the combination of Inui and Sueoka would not yield Applicants' invention of claim 18.

Accordingly, claim 18 is believed allowable in its present form.

Claim 19 is believed allowable due to its dependence on otherwise allowable base claim 18. In addition, claim 19 further and patentably defines the invention over Inui and Sueoka, taken alone or in combination.

For example, claim 19 is directed to the printhead cartridge of claim 18, wherein said decoder circuit decodes each said composite fire signal into a plurality of actuator fire signals.

Contrary to the Examiner's assertion, Inui simply does not disclose, teach, or suggest a composite fire signal within the context of Applicants' claimed invention, much less decoding

a composite fire signal into a plurality of actuator fire signals. Rather, the Inui enabling signal is not even provided as an input to the Inui decoder 57.

In addition, as set forth above with respect to claim 18, the Inui three-value gradation data is known in the art as print data, and clearly does not disclose, teach, or suggest a fire signal within the context of Applicants' invention.

Sueoka does not disclose, teach, or suggest the subject matter recited in claim 19, nor does the Examiner assert as much. Rather, the Examiner relies on Inui as assertedly disclosing the subject matter of claim 19.

Accordingly, claim 19 is believed allowable in its own right.

Claim 24 is directed to a printhead for an ink jet printer. Claim 24 recites, in part, a decoder circuit in communication with said actuator firing logic circuit, said decoder circuit including at least one input for receiving at least one composite fire signal.

Claim 24 is believed allowable in its present form for substantially the same reasons as set forth above with respect to claim 18.

Claim 25 is directed to the printhead of claim 24, wherein said decoder circuit decodes each said composite fire signal into a plurality of actuator fire signals.

Claim 25 is believed allowable for substantially the same reasons as set forth above with respect to claim 19.

In addition, claim 25 is believed allowable due to its dependence on otherwise allowable base claim 24.



Accordingly, for at least the reasons set forth above, Applicants believe that claims 18, 19, 24, and 25 are in condition for allowance in their present form, and thus respectfully request that the rejection of claims 18, 19, 24, and 25 under 35 U.S.C. 103(a) be withdrawn.

Claims 20, 21, 26, and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Inui, in view of Sueoka, and in further view of Umezawa. Applicants respectfully request reconsideration of the rejection of claims 20, 21, 26, and 27 in view of the following.

Applicants believe that claims 20, 21, 26, and 27 patentably define Applicants' invention over Inui in view of Sueoka and in further view of Umezawa, for at least the reasons set forth below.

Applicants have submitted arguments in their Response, mailed February 27, 2006, which clearly show that claims 20, 21, 26, and 27 are patentable over Inui, in view of Sueoka, and in further view of Umezawa.

Under MPEP 707.07(f), where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it.

However, the Examiner has not answered the substance of Applicants' arguments. Accordingly, Applicants' respectfully request the Examiner to withdraw the rejection of claims 20, 21, 26, and 27, or to provide Applicants' with an answer to their arguments.

For the sake of convenience to the Examiner, Applicants' set forth their arguments pertaining to claims 20, 21, 26, and 27 below.

Claim 20 is directed to the printhead cartridge of claim 18, wherein said at least one composite fire signal includes a plurality of color composite fire signals.

The Examiner acknowledges that Inui as modified by Sueoka does not disclose, teach, or suggest the subject matter of claim 20, but rather, relies on Umezawa in rejecting the subject matter recited in claim 20.

However, Umezawa does not disclose, teach, or suggest wherein said at least one composite fire signal includes a plurality of color composite fire signals for substantially the same reasons as set forth above with respect to claim 30.

Accordingly, Inui, Sueoka, and Umezawa, taken alone or in combination, do not disclose, teach, or suggest the subject matter of claim 20, and the combination of Inui, Sueoka, and Umezawa would not yield Applicants' invention of claim 20.

In addition, claim 20 is believed allowable due to its dependence on otherwise allowable base claim 18.

Accordingly, claim 20 is believed allowable in its present form.

Claim 21 is directed to the printhead cartridge of claim 20, wherein said plurality of color composite fire signals is associated with a plurality of ink colors.

The Examiner acknowledges that Inui as modified by Sueoka does not disclose, teach, or suggest the subject matter of claim 21, but rather, relies on Umezawa in rejecting the subject matter recited in claim 21.

However, Umezawa does not disclose, teach, or suggest wherein said plurality of color composite fire signals is associated with a plurality of ink colors for substantially the same reasons as set forth above with respect to claim 30.

Accordingly, Inui, Sueoka, and Umezawa, taken alone or in combination, do not disclose, teach, or suggest the subject matter of claim 21, and the combination of Inui, Sueoka, and Umezawa would not yield Applicants' invention of claim 21.

In addition, claim 21 is believed allowable due to its dependence on otherwise allowable base claim 18 and/or intervening claim 21.

Accordingly, claim 21 is believed allowable in its present form.

Claim 26 is directed to the printhead of claim 24, wherein said at least one composite fire signal includes a plurality of color composite fire signals.

Claim 26 is believed allowable in its present form for substantially the same reasons as set forth above with respect to claim 20.

Claim 27 is directed to the printhead of claim 26, wherein said plurality of color composite fire signals is associated with a plurality of ink colors.

Claim 27 is believed allowable in its present form for substantially the same reasons as set forth above with respect to claim 21.

Accordingly, for at least the reasons set forth above, Applicants believe that claims 20, 21, 26, and 27 are in condition for allowance in their present form, and thus respectfully request that the rejection of claims 20, 21, 26, and 27 under 35 U.S.C. 103(a) be withdrawn.

Claims 22, 23, 28, and 29 were rejected under 35 U.S.C. §103(a) as being unpatentable over Inui in view of Sueoka, and in further view of Kao. Applicants respectfully request reconsideration of the rejection of claims 22, 23, 28, and 29 in view of the following.

Applicants believe that claims 22, 23, 28, and 29 patentably define Applicants' invention over Inui in view of Sueoka and in further view of Kao, for at least the reasons set forth below.

Applicants have submitted arguments in their Response, mailed February 27, 2006, which clearly show that claims 22, 23, 28, and 29 are patentable over Inui in view of Sueoka, and in further view of Kao.

Under MPEP 707.07(f), where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it.

However, the Examiner has not answered the substance of Applicants' arguments. Accordingly, Applicants' respectfully request the Examiner to withdraw the rejection of claims 22, 23, 28, and 29, or to provide Applicants' with an answer to their arguments.

For the sake of convenience to the Examiner, Applicants' set forth their arguments pertaining to claims 22, 23, 28, and 29 below.

Claim 22 is directed to the printhead cartridge of claim 18, wherein each said composite fire signal includes a plurality of actuator fire signals, each actuator fire signal including a prefire signal and mainfire signal.

The Examiner acknowledges that Inui in view of Sueoka does not disclose, teach, or suggest the subject matter of claim 22, but rather, relies on Kao in rejecting the subject matter recited in claim 22.

However, Kao does not disclose, teach, or suggest wherein each said composite fire signal includes a plurality of actuator fire signals, each actuator fire signal including a prefire

signal and mainfire signal, since Kao does not disclose, teach, or suggest a composite fire signal, for substantially the same reasons as set forth above with respect to claim 1.

Accordingly, Inui, Sueoka and Kao, taken alone or in combination, do not disclose, teach, or suggest the subject matter of claim 22, and the combination of Inui, Sueoka and Kao would not yield Applicants' invention of claim 22.

In addition, claim 22 is believed allowable due to its dependence on otherwise allowable base claim 18.

Accordingly, claim 22 is believed allowable in its present form.

Claim 23 is directed to the printhead cartridge of claim 18, wherein each said composite fire signal includes a plurality of actuator fire signals, at least one said plurality of actuator fire signals interlaced with an other said plurality of actuator fire signals.

The Examiner acknowledges that Inui in view of Sueoka does not disclose, teach, or suggest the subject matter of claim 23, but rather, relies on Kao in rejecting the subject matter recited in claim 23.

However, Kao does not disclose, teach, or suggest wherein each said composite fire signal includes a plurality of actuator fire signals, at least one said plurality of actuator fire signals interlaced with an other said plurality of actuator fire signals, since Kao does not disclose, teach, or suggest a composite fire signal, for substantially the same reasons as set forth above with respect to claim 1.

In addition Kao does not disclose, teach, or suggest any interlaced fire signals within the context of Applicants invention, for substantially the same reasons as set forth above with respect to claim 6.

Accordingly, Inui, Sueoka and Kao, taken alone or in combination, do not disclose, teach, or suggest the subject matter of claim 23, and the combination of Inui, Sueoka and Kao would not yield Applicants' invention of claim 23.

Further, claim 23 is believed allowable due to its dependence on otherwise allowable base claim 18.

Accordingly, claim 23 is believed allowable in its present form.

Claim 28 is directed to the printhead of claim 24, wherein each said composite fire signal includes a plurality of actuator fire signals, each actuator fire signal including a prefire signal and mainfire signal.

Claim 28 is believed allowable in its present form for substantially the same reasons as set forth above with respect to claim 22.

Claim 29 is directed to the printhead of claim 24, wherein each said composite fire signal includes a plurality of actuator fire signals, at least one said plurality of actuator fire signals interlaced with an other said plurality of actuator fire signals.

Claim 29 is believed allowable in its present form for substantially the same reasons as set forth above with respect to claim 23.

Accordingly, for at least the reasons set forth above, Applicants believe that claims 22, 23, 28, and 29 are in condition for allowance in their present form, and thus respectfully request that the rejection of claims 22, 23, 28, and 29 under 35 U.S.C. 103(a) be withdrawn.

Claims 2-4, 8, and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kao in view of Inui. Applicants respectfully request reconsideration of the rejection of claims 2-4, 8, and 9 in view of the following.

Applicants believe that claims 2-4, 8, and 9 patentably define Applicants' invention over Kao in view of Inui, for at least the reasons set forth below.

Applicants have submitted arguments in their Response, mailed February 27, 2006, which clearly show that claims 2-4, 8, and 9 are patentable over Kao in view of Inui.

Under MPEP 707.07(f), where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it.

However, the Examiner has not answered the substance of Applicants' arguments. Accordingly, Applicants' respectfully request the Examiner to withdraw the rejection of claims 2-4, 8, and 9, or to provide Applicants' with an answer to their arguments.

For the sake of convenience to the Examiner, Applicants' set forth their arguments pertaining to claims 2-4, 8, and 9 below.

Claim 2 is directed to the method of claim 1, further including the step of decoding said composite fire signal thereby producing a plurality of decoded fire signals.

The Examiner acknowledges that Kao does not disclose, teach, or suggest the subject matter of claim 2, but rather, relies on Inui in rejecting the subject matter recited in claim 2.

However, Inui does not disclose, teach, or suggest decoding said composite fire signal thereby producing a plurality of decoded fire signals, since Inui does not disclose, teach, or suggest decoding fire signals, for substantially the same reasons as set forth above with respect to claim 18, and since Inui does not disclose, teach, or suggest composite fire signals for substantially the same reasons as set forth above with respect to claim 18.

Accordingly, Kao and Inui, taken alone or in combination, do not disclose, teach, or suggest the subject matter of claim 2, and the combination of Kao and Inui would not yield Applicants' invention of claim 2.

In addition, claim 2 is believed allowable due to its dependence on otherwise allowable base claim 1.

Accordingly, claim 2 is believed allowable in its present form.

Claim 3 is directed to the method of claim 2, further including the step of energizing a plurality actuators using said plurality of decoded fire signals.

Since Kao and Inui, taken alone or in combination, do not disclose, teach, or suggest a plurality of decoded fire signals, as set forth above with respect to claim 2, it follows that Kao and Inui, taken alone or in combination, do not disclose, teach, or suggest energizing a plurality actuators using said plurality of decoded fire signals, as recited in claim 3.

In addition, claim 3 is believed allowable due to its dependence on otherwise allowable base claim 1 and/or intervening claim 2.

Accordingly, claim 3 is believed allowable in its present form.

Claim 4 is directed to the method of claim 3, wherein said plurality of decoded fire signals is associated with a plurality of ink colors.

Claim 4 is believed allowable due to its dependence on otherwise allowable base claim 1 and/or intervening claims 2 and 3.

In addition, Kao and Inui, taken alone or in combination, simply do not disclose, teach, or suggest decoded fire signals being associated with a plurality of ink colors, nor does the Examiner assert as much.



Accordingly, claim 4 is believed allowable in its present form.

Claim 8 is directed to the ink jet printer of claim 7. Claim 8 recites, in part, a decoder circuit connected to said actuator firing logic circuit, said decoder circuit including at least one input for receiving said composite fire signal.

The Examiner acknowledges that Kao does not disclose, teach, or suggest the subject matter of claim 8, but rather, relies on Inui in rejecting the subject matter recited in claim 8.

However, Inui does not disclose, teach, or suggest a decoder circuit connected to said actuator firing logic circuit, said decoder circuit including at least one input for receiving said composite fire signal, as recited in claim 8, for substantially the same reasons as set forth above with respect to claim 18.

Accordingly, Kao and Inui, taken alone or in combination, do not disclose, teach, or suggest the subject matter of claim 8, and the combination of Kao and Inui would not yield Applicants' invention of claim 8.

In addition, claim 8 is believed allowable due to its dependence on otherwise allowable base claim 7.

Accordingly, claim 8 is believed allowable in its present form.

Claim 9 is directed to the ink jet printer of claim 8, wherein said decoder circuit decodes said composite fire signal into a plurality of actuator fire signals.

Claim 9 is believed allowable due to its dependence on otherwise allowable base claim 1 and/or intervening claim 7.

Accordingly, for at least the reasons set forth above, Applicants believe that claims 2-4, 8, and 9 are in condition for allowance in their present form, and thus respectfully request that the rejection of claims 2-4, 8, and 9 under 35 U.S.C. 103(a) be withdrawn.

Claim 10 was rejected under 35 U.S.C. §103(a) as being unpatentable over Kao in view of Inui, and in further view of Arquilevich, U.S. Patent No. 6,578,943 B2 (hereinafter, Arquilevich). Applicants respectfully request reconsideration of the rejection of claim 10 in view of the following.

Arquilevich is directed to a printing technique for minimizing unequal swath boundary behavior across print regions produced by an inkjet printer.

Applicants believe that claim 10 patentably defines Applicants' invention over Kao in view of Inui, and in further view of Arquilevich, for at least the reasons set forth below.

Applicants have submitted arguments in their Response, mailed February 27, 2006, which clearly show that claim 10 is patentable over Kao in view of Inui, and in further view of Arquilevich.

Under MPEP 707.07(f), where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it.

However, the Examiner has not answered the substance of Applicants' arguments. Accordingly, Applicants' respectfully request the Examiner to withdraw the rejection of claim 10, or to provide Applicants' with an answer to their arguments.

For the sake of convenience to the Examiner, Applicants' set forth their arguments pertaining to claim 10 below.

Claim 10 is directed to the ink jet printer of claim 8, further including a printhead cartridge connected to said printhead carrier and thereby connected to said controller, said printhead being integral with said printhead cartridge.

Claim 10 is believed allowable due to its dependence on otherwise allowable base claim 7 and/or intervening claim 8, since Arquilevich does not disclose, teach, or suggest the subject matter of claim 8 or otherwise make up for the deficiency of Kao in view of Inui as applied to claim 8, nor does the Examiner assert as much.

Accordingly, for at least the reasons set forth above, Applicants believe that claim 10 is in condition for allowance in its present form, and thus respectfully request that the rejection of claim 10 under 35 U.S.C. 103(a) be withdrawn.

For the foregoing reasons, Applicants submit that no combination of the cited references teaches, discloses or suggests the subject matter of the appended claims. The pending claims are therefore in condition for allowance, and Applicants respectfully request withdrawal of all rejections and allowance of the claims.

In the event Applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefor and authorize that any charges be made to Deposit Account No. 20-0095.

For the foregoing reasons, Applicants submit that no combination of the cited references teaches, discloses or suggests the subject matter of the pending claims. The pending claims are therefore in condition for allowance, and Applicants respectfully request withdrawal of all rejections and allowance of the claims.

In the event Applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefor and authorize that any charges be made to Deposit Account No. 20-0095, TAYLOR & AUST, P.C.

Should any question concerning any of the foregoing arise, the Examiner is invited to telephone the undersigned at (317) 894-0801.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on: June 30, 2006.

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Name of Registered Representative



Signature

June 30, 2006

Date